



What Pharmacists Would Like Team Members to Know About Medication Therapy for Diabetes

In this section, you will find an overview of key issues related to medication therapy management and diabetes in order to support the pharmacy, podiatry, optometry, and dentistry (PPOD) model of team care. The information presented in this section validates key Healthy People 2020 objectives for diabetes and reinforces your value as PPOD professionals in the team care approach to comprehensive diabetes care.

Healthy People 2020 National Objectives (Released by the U.S. Department of Health and Human Services each decade, [Healthy People](#) is a set of goals and objectives with 10-year targets designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States.)

Diabetes Objective #10 (D-14): Increase the proportion of persons with diagnosed diabetes who receive formal diabetes education.

Target: 62.5%.

Baseline: 56.8% of adults ages 18 years and older with diagnosed diabetes reported they ever received formal diabetes education in 2008 (age adjusted to the year 2000 standard population).

Target Setting Method: 10% improvement.

Data Source: [Behavioral Risk Factor Surveillance System](#) (BRFSS), Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion.

Current Data and Trends

Medication therapy management (MTM) has traditionally been concerned with ensuring correct dosage, avoiding drug interactions, and educating patients about possible side effects.

People identified as being at high risk for drug-related problems include those who:

- Have multiple medical conditions.
- Take multiple medications.
- See multiple health care providers.

Because people with diabetes often fall into these categories, MTM is especially important.

PPOD professionals can provide MTM by:

- Conducting comprehensive reviews of medication and medical records.
- Educating patients to improve the safety and appropriate use of medications.
- Assessing the patient's response to therapy to ensure timely interventions, communication back to primary care and other providers, and coordination and continuity of care.

Today's pharmaceuticals and advanced medical technologies offer many therapeutic options for treating diabetes and its comorbidities. If these medications are used inappropriately, however, they can cause serious illness, long-term disability, or even death.

The latest study shows that misuse of prescription drugs in the United States costs \$177 billion annually in additional treatments, hospital care, and doctor visits, up from \$76.5 billion in 1995. More important than the costs, however, this study estimates that 1.5 million adverse drug events are preventable, yet 218,000 prescription drug-related deaths annually are due to misused prescription medications.¹

Patient Case Example

A man living with diabetes for more than 20 years asks the pharmacist for advice on care of his foot, which is warm, red, and swollen. The man recalls no trauma, and there is no evidence of skin breakdown or an open wound.

The pharmacist arranges for a same-day referral to a podiatrist for examination.

Upon a physical exam and an x-ray of the affected foot, the podiatrist diagnoses Charcot's arthropathy and implements a plan of treatment with no weight bearing and close follow-up, with casting, until the edema resolves.

The pharmacist also refers the man to the [NDEP website](#), if he has a computer, for helpful materials about managing diabetes.



Drug-related problems can be grouped into several categories, including:

- Inappropriate drug choice
- Underdosage
- Overdosage
- Adverse drug reactions
- Drug interactions
- Undertreatment

Additional identified factors include untreated medical conditions and medication use with no indication.^{2,3}

Drug-related Problems

Patients can experience a number of problems related to their use of medication, including:

- More than 50% of those with chronic disorders do not take their medication properly (such as correct time, correct dose, or in relation to eating).
- Only about 50% of persons with diabetes reach their blood glucose goals as measured by A1C.
- Of persons treated for high blood pressure and high cholesterol, 51% and 56%, respectively, reach target blood pressure and total cholesterol levels. Only 18% reached all three ABC goals.⁴

Patient Case Example

A dental hygienist asks if a patient's medications have changed since the last visit and discovers the patient is confused about how to take a newly prescribed medicine. The patient asks if "twice a day" means at specific times each day, and if the medication may be taken at the same time as other medications. He states, "It's hard to find time to take all these medicines in 1 day!"

The dental hygienist reinforces the importance of taking the medicine as directed. She suggests consulting with the provider who prescribed the medicines and with the pharmacist, who may be immediately accessible and can work with the patient to create an individualized regimen.

To improve medication-taking behaviors and minimize these health care adversities, medication therapy regimens must be regularly and carefully evaluated and monitored. Correct use of medication improves health and saves money for the health care system.^{5,6,7}

Role of the Pharmacist in Diabetes Care Management



The pharmacist can play an important role in the care of the diabetes patient. The American Diabetes Association, in its clinical guidelines statement, recognizes that pharmacists may provide care beyond dispensing of drugs to include services such as counseling patients on diabetes self-management and improving medication taking.⁸ Pharmacists are also playing a role in the timely administration of recommended vaccines for people with diabetes, including influenza, pneumococcal, and hepatitis B.

Many studies have demonstrated the effectiveness of pharmacists in diabetes management.⁹ In particular, the Asheville Project is a landmark study that used community pharmacists in Asheville, North Carolina, to help manage diabetes care and educate employees of the City of Asheville who had diabetes. After 1 year, employees had significantly reduced their A1C and low-density lipoprotein cholesterol levels, and this improvement was sustained 5 years later. Notably, employees reduced total direct medical costs by \$1,200 to \$1,800 per patient per year for this self-insured employer, and productivity was increased by \$18,000.¹⁰

The [Diabetes Ten City Challenge \(DTCC\)](#), sponsored by the American Pharmacists Association (APhA) Foundation, engaged 30 employers in 10 cities and provided a voluntary health benefit to employees, dependents, and retirees with diabetes; waived copays for diabetes medications and supplies; and helped people manage their diabetes on a day-to-day basis with the help of hundreds of specially trained pharmacist “coaches.” Employers realized an average annual savings of almost \$1,100 in total health care costs per patient when compared to projected costs if the DTCC had not been implemented. Participants saved an average of almost \$600 per year.¹¹



In summary, the pharmacist is an accessible and valuable health care team member who can help patients with diabetes improve their overall health and diabetes outcomes through medication management.

Strategies for Managing Drug Therapy

People with diabetes should establish an ongoing relationship with a pharmacist who can help them monitor drug regimens, advise on how to take medications safely and for maximum effectiveness, provide other information to help them manage their diabetes, and communicate information and recommendations back to their health care provider. Strategies include the following:

Use of Medications

Pharmacists can individualize drug regimens to reduce the patient's risk of side effects and drug interactions and offer behavioral strategies, reminders and other aids, appropriate dosage, and a drug delivery system.

Optimized Selection of Medications

Depending on the presence of a collaborative practice agreement between the pharmacist and the physician, the pharmacist may be able to adjust medications to improve dosing or to add/delete drugs that may or may not be valuable. For example, the pharmacist may switch to generic drugs for improved affordability, and can identify drugs that may have caused or have the potential to cause adverse drug reactions. Even without a collaborative practice with a physician, a proactive pharmacist can provide physicians with recommendations to consider for optimizing medication use. In addition, pharmacists can advise patients on topics such as:

- **Self-treatment and over-the-counter medications.** Ask patients with diabetes if they are using nonprescription medications; vitamin, herbal, or nutritional supplements; or topical and skin care products.

Assess the severity and urgency of the person's complaint, the appropriateness for self-treatment, and any precautions and contraindications. Recommend self-treatment, follow-up, and/or referral to another health care professional, as appropriate. One study reported that more than 40% of people with diabetes use complementary and alternative therapies.¹²

- **Selection and use of a blood glucose meter.** Help the patient choose an appropriate blood glucose meter and provide training on how to use it. Educate the person about the results, actions to take, and when to seek help. Self-monitoring of blood glucose is an important way to assess the effectiveness of therapy.
- **Cost control.** Advise the patient on ways to decrease the costs of medications and supplies by providing information on private insurance plans, pharmaceutical company and other drug programs, Medicare and Medicaid, the role of generic medications, and possible coverage for referrals to other health care professionals.

Coordination of Care

Coordination of care presents many challenges when delivered by multiple providers in a variety of settings.

Changes in drug therapy may occur when patients see specialty providers or experience acute illness or hospitalization. When a patient's situation includes multiple disease states and multiple drugs, along with over-the-counter medications, herbal products, and other supplements, diligent case management is required to ensure well-coordinated continuity of care.¹²

As an extension of the dispensing role of pharmacists, central medication review and drug therapy management (including oversight of nonprescription products) can ensure that a current appropriate drug therapy plan is implemented.

In one study, when pharmacists and other health care providers practiced collaborative drug therapy management (CDTM), they identified problems in 65% of patients' drug regimens.¹³

Patient Case Example

A 40-year-old woman asks her local pharmacist for advice on reading glasses. She says, "I must be getting older; everything is just blurry."

The pharmacist discovers that the patient has a history of diabetes, diagnosed the previous year, but she never returned for follow-up. The pharmacist advises the woman that her blurred vision may in fact be a sign of diabetes. He arranges for her to be seen by a primary care provider and eye care provider for follow-up.

He also refers her to the [NDEP website](#), if she has a computer, for helpful materials about managing diabetes.



Medication Therapy Management and Diabetes

In other studies, CDTM resulted in decreased morbidity and mortality, as well as decreased costs attributable to fewer unscheduled physician visits, urgent care visits, emergency room visits, and hospital days.^{2,6,14}

With coordinated care, all members of the health care team, including the patient, benefit from having a primary resource to deliver intended drug therapy, information, and monitoring for effectiveness and adverse effects. This coordination will help ensure adherence to the intended treatment plan and identify drug and disease management problems in a timely manner.

Key Questions That All Members of the Health Care Team Should Ask Patients About Their Medications

Patients should be referred to a pharmacist if the answers to these questions are “no” or “unsure”:

- Do you bring a list of all your medicines and the exact doses, including over-the-counter medicines, vitamins, and herbal supplements, to all of your appointments?
- Do you know the reason why you take each medicine?
- Do you know how your medicines affect your diabetes?
- Do you update and review your list with your pharmacist when there is a change?
- Do you know how to safely take your medicine and use supplies to get the most benefit at the lowest cost?
- Have you reported any side effects from your medicines to your pharmacist?
- Do you let your pharmacist know if you have a problem with missing doses of your medicines?

Patient Education

Pharmacists can inform all patients about the connection between managing their medications and diabetes. Pharmacists can help patients manage their medications by:

- Printing out or encouraging patients to make a list of all medicines, including over-the-counter medicines, vitamins, and herbal supplements, and the exact doses they take, and take it to all health care provider appointments.
- Reminding patients to update and review their medication list every time there is a change.
- Teaching patients how to take their medicine for maximum benefit and safety, and how to use their supplies to get the best results at the lowest cost.
- Discussing new medicines that patients can talk about with their provider.

Please visit the [Resource Center](#) section of the PPOD Guide and Toolkit for resources on medication management.



Key Points

- Pharmacists are important participants in a team care approach for diabetes management because they can help patients get the most benefits from their medications by actively managing drug therapy and by identifying, preventing, and resolving medication-related problems.¹⁵
- Pharmacists play a key role in diabetes self-management education.



References

1. Ernst FR, Grizzle AJ. Drug-related morbidity and mortality: Updating the cost of illness model. *J Am Pharm Assoc.* 2001; 41:192–9.
2. Johnson JA, Bootman JL. Drug-related morbidity and mortality. A cost-of-illness model. *Arch Intern Med.* 1995; 155(18):1949–56.
3. Bootman JL. The \$76 billion wake-up call. *J Am Pharm Assoc (Wash).* 1996 Jan; NS36(1):27–8.
4. Stark Casagrande S, Fradkin JE, Saydah SH, Rust KF, Cowie CC. The Prevalence of meeting A1C, blood pressure, and LDL goals among people with diabetes, 1988-2010. *Diabetes Care.* 2013; 36(8):2271–9.
5. Galt KA. Cost avoidance, acceptance, and outcomes associated with a pharmacotherapy consult clinic in a Veterans Affairs Medical Center. *Pharmacotherapy.* 1998; 8(5):1103–11.
6. Bluml BM, McKenney JM, Cziraky MJ. Pharmaceutical care services and results in project ImPACT: Hyperlipidemia. *J Am Pharm Assoc.* 2000; 40(2):157–65.
7. Tsuyuki RT, Johnson JA, Teo KK, et al. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: The Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP). *Arch Intern Med.* 2002; 162(10): 1149–55.
8. American Diabetes Association. Standards of medical care in diabetes – 2013. *Diabetes Care.* 2013; 36(1):S11–S66.
9. Wubben DP, Vivian EM. Effects of pharmacist outpatient interventions on adults with diabetes mellitus: A systematic review. *Pharmacotherapy.* 2008; 28(4):421–36.
10. Cranor CW, Bunting BA, Christensen DB. The Asheville Project: Long-term clinical and economic outcomes of a community pharmacy diabetes care program. *J Am Pharm Assoc.* 2003;43(2):173–84.
11. Fera T, Bluml BM, Ellis WM. Diabetes Ten City Challenge: Final economic and clinical results. *J Am Pharm Assoc.* 2009;49:e52–e60.
12. DiNardo M, Gibson J, Siminerio L, Morell A, Lee E. Complementary and Alternative Medicine in Diabetes Care. *Curr Diab Rep.* 2012;12:749–761.
13. Borgsdorf LR, Miano JS, Knapp KK. Pharmacist-managed medication review in a managed care system. *Am J Hosp Pharm.* 1994;51:772–7.
14. Hitchcock AM, Lousberg TR, Merenich J. The impact of clinical pharmacy management on cardiovascular risk reduction in patients with established heart disease in a group model health maintenance organization. *Pharmacotherapy.* 2000; 20:360–1, abstract 135.
15. Centers for Disease Control and Prevention. [A program guide for public health: Partnering with pharmacists in the prevention and control of chronic diseases.](#) August 2012.



Over-the-counter medications can interact with prescription medications. Encourage patients to consult with the pharmacist.



Many people need additional counseling on HOW to take medications—for example, with meals or on an empty stomach, or whether “three times a day” means breakfast, lunch, and dinner or every eight hours.



Encourage patients to bring all bottles in to the pharmacist to review regularly.



Tools are available to help patients keep track of multiple medications.



Pharmacists can coach the family to help with diabetes control and the use of supplies.



Pharmacists can help obtain medicines less expensively.